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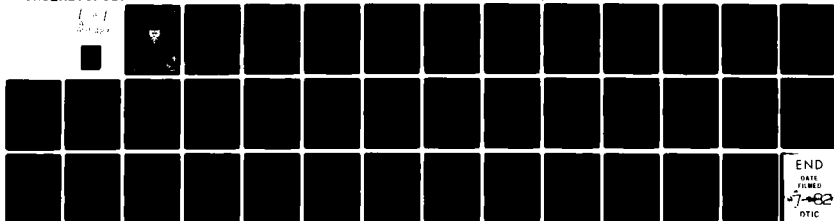
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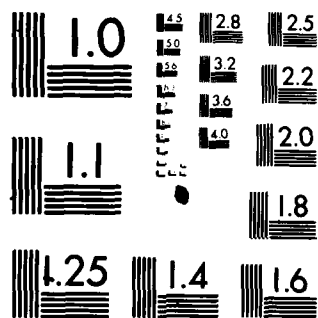
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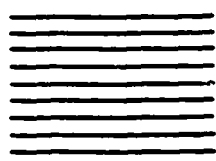


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## STUDENT RESEARCH REPORT

THE TRAINING OF SOVIET AIR DEFENSE  
TROOPS: ITS NATURE, OBJECTIVES AND  
EFFECTIVENESS

MAJ WILLIAM D. O'MALLEY  
1980

GARMISCH, GERMANY

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THE TRAINING OF SOVIET AIR DEFENSE TROOPS:  
ITS NATURE, OBJECTIVES  
AND EFFECTIVENESS

MAJOR WILLIAM D. O'MALLEY

June 1980

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## FOREWORD

This research project represents fulfillment of a student requirement for successful completion of the overseas phase of training of the Department of the Army's Foreign Area Officer Program (Russian).

Only unclassified sources are used in producing the research paper. The opinions, value judgements and conclusions expressed are those of the author and in no way reflect official policy of the United States Government, Department of Defense, Department of the Army, the US Army Intelligence and Security Command, or the Russian Institute. The completed paper is not to be reproduced in whole or in part without permission of the Commander, US Army Russian Institute, APO New York 09053.

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## SUMMARY

This study examines the nature, objectives and effectiveness of training for Soviet air defense troops. While discussing the unique structure of the Soviet semi-annual draft call-up and the training situations this call-up entails, the paper places special emphasis on 10 major areas in Soviet air defense training. The Soviets' primary challenge in air defense training is the development and implementation of a training program that will quickly and effectively equip new recruits with the necessary theoretical and practical skills to assume their combat role. On the basis of the analyzed material, the author concludes that the training system, procedures and techniques the Soviets have developed are directed against two critical problems: TIME and QUALITY. The author then points out those areas in air defense training in which the Soviets are successful while discussing the weaknesses of their program in the context of a comparison with U.S. air defense training procedures.

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## INTRODUCTION

This paper will analyze the major trends and approaches taken by the Soviets toward the training of their air defense troops. Because of the Soviet system of two years of universal service and semi-annual call-up, the Soviet military is forced to train a group of new recruits every six months and to compensate for approximately a 40% turnover in personnel every year. In addition, units are confronted by many and varied problems created by language and nationality differences, as well as a wide range of educational abilities and skills. The primary challenge for the Soviets is the development and implementation of a training program that will quickly and effectively equip new recruits with the necessary theoretical and practical skills to assume their combat role.

The Soviets' training problems are further magnified by the influx of modern technology into the armed forces. The Soviet air defense forces have inherited a great deal of this modern combat technology during the course of development and subsequent upgrading of Soviet air defense systems. Air defense systems must be categorized as collective weapons systems because success in combat depends on coordinated work on the part of each man in the combat crew, the entire crew as a whole, plus the coordination and interaction between several subsections; e.g., the relaying of information and target data between the radar section, the command post and the firing section. Therefore, the overall combat effectiveness of the system is dependent on the combat readiness of each individual and the overall ability of the crews within the system to function as a whole. Each soldier must not only have an excellent knowledge of the combat equipment he handles and be able to work with it, but must undergo daily training sessions in precise and timely execution of his duties, pressing toward an almost automatic response. Due to the complexity of this equipment's operation, the tremendous amount of information and data that must be gathered, analyzed, evaluated and processed by the officers and many enlisted specialists in the combat crews, the air defense system cannot be supported and operated by individuals with a minimal level of combat training.

The contemporary podrazdeleniye of the air defense forces... is a complex organization saturated with the most modern combat technology and armament. Soldiers of various specialties serve in it, people who have different characteristics and varying levels of training. This determines the necessity to utilize each hour and minute of training time with the highest degree of effectiveness, to ensure the constant readiness of each specialist for unconditional accomplishment of assigned combat missions.<sup>1</sup>

Marshal of the Soviet Union A. A. Grechko further emphasized these points in the following quote:

The continuous development of weapons and combat equipment, and the appearance of new and improved types of combat actions complicate the process of training and educating personnel and place ever higher requirements on officer cadre, making it necessary constantly to improve methods of training and educational work, on whose quality the success of combat, political, and operational training depends, as does the level of combat might.<sup>2</sup>

These comments outline many of the problems facing the Soviet air defense forces, as well as the Soviet military as a whole, and the importance placed by the Soviets

upon the ever-increasing role of training in the everyday life of the Soviet officer and soldier alike.

This paper will discuss ten major areas in the Soviet air defense trainings:

- (1) What is the pretesting of new recruits and how is this pretesting important in job placement?
- (2) What is the extreme value of a good teaching/training plan and how detailed are these plans?
- (3) What is stage-by-stage training and why do the Soviets feel this is important?
- (4) What is side-by-side training and how does this training aid in solving the Soviets' soldier turnover problem?
- (5) Why do the Soviets place such heavy emphasis on electronic teaching aids and what are their capabilities and intended results?
- (6) Why is the critique considered to be as important a training tool as the actual training exercise?
- (7) What is the role of competition, recognition and reward in air defense units?
- (8) What are combat watch and tactical exercises and can these types of training actually produce troops who can quickly and effectively handle the tactical operation of their equipment and the required level of communication and coordination with other units to support the successful completion of the combat mission?
- (9) What type of exercises are used to test the effectiveness and level of the unit's training and its overall combat readiness?
- (10) How successful are the Soviets in completing what they consider their primary training mission "...to develop practical skills in personnel that are necessary for confident actions in combat with a strong and insidious air enemy"?<sup>3</sup>

In researching this topic, two Soviet military publications, Vestnik Protivovozdushnoy Oborony and Voyennyy Vestnik, were the primary sources used. Vestnik Protivovozdushnoy Oborony was selected because it is the monthly publication designed for distribution to the air defense troops (primarily the National Air Defense troops; however, much of the material printed can be applied generally to any air defense system). Voyennyy Vestnik was used because of the rather frequent coverage of air defense topics within this publication. Both publications print many articles specifically directed toward the discussion of combat training.

According to Colonel I. Gurinov, "the forms and methods of controlling the training of personnel are laid down in appropriate governing documents and articles on this theme, which have appeared in the journal Vestnik Protivovozdushnoy Oborony many times."<sup>4</sup> Statements such as this give credence to the role open military publications can play in gaining insights into Soviet military establishment.

Training is a topic which receives treatment in depth within these publications over any given time period. It is evident that better than one half of all articles published deal directly with training problems, procedures, techniques, aids, as well as examples of the application of these means into specific training situations.<sup>5</sup> It is through these publications that one can gain insight into the philosophy, nature, organization, procedure and techniques as well as criticisms and successes of this training program as specifically applied to the unique features of the air defense unit.

## CHAPTER I

### PREPARATION AND SELECTION FOR TRAINING

Our army is equipped with the most complex equipment and armament whose combat utilization is, as a rule, collective. Modern warfare is complicated, swift and dynamic. Under these conditions, the precept of V. I. Lenin to the defenders of the Motherland acquires special significance: 'Learn military affairs realistically.' And this is of course understandable. To utilize...the remarkable combat potential of the anti-aircraft missile complex, the automated control system, or the radar station with maximum effectiveness is only within reach of soldiers who are capable, who are strong in mind and body, who profoundly and comprehensively know the enemy, his equipment and the tactics of its combat application, who clearly and efficiently understand the combat mission and the modes of its accomplishment. These qualities are gained in the process of daily training.<sup>6</sup>

For the Soviet political and military leadership the spiraling growth in the level of technology and sophistication of modern weaponry has created some problems of major proportion, as they attempt to train an effective military contingent. To accomplish these tasks the Soviet military today must maintain a broadly based and highly sophisticated training system. As with the Soviet officer, the Soviet soldier begins his military indoctrination long before he begins his two years of mandatory service. All Soviet youth begin their basic military training in the ninth and tenth grades (about 15 years old).<sup>7</sup>

During the period of pre-induction training the recruits receive, as a minimum, a program of basic military training. Under the law on universal military obligation DOSAAF (The Voluntary Society for Cooperation with the Army, Air Force, and the Navy) is additionally charged with the responsibility of preparing specialists for the Armed Forces from among the seventeen year olds who have registered for the call-up.<sup>8</sup>

This type of training makes up a considerable part of the program of basic military training for middle school students. The youngsters, while they are still in school, begin to learn such military specialties as vehicle driver, motorcyclist, radiotelephonist, operator-programmer, electrician, mine-planter, chemical-radiation monitor, parachute packer and others. The upper classmen learn a specialty that usually is comparable to the polytechnical or vocational training offered in the school. For example, if the school has vehicle study courses, the students will during their military technical training, learn the specialty of vehicle driver, while those schools that stress mathematics will teach the specialty of operator-programmer, and so on.<sup>9</sup>

The training provided, where possible by the middle schools, is supplemented by training at DOSAAF clubs or training facilities. The exact number of these programs and the numbers and exact types of programs taught is unknown. Harriet

Fast and William F. Scott in their book The Armed Forces of the USSR indicate that the DOSAAF flight training is of major proportion and has provided a significant number of candidates for the Soviet pilot training program.<sup>10</sup> Lieutenant General Popov also indicates that there is at least one school where radar operators are trained.<sup>11</sup> However, the availability of this specialty training is based on local school plant facilities and the willingness and availability of assistance from the military commissariats and DOSAAF organizations.<sup>12</sup>

This program of pre-induction specialty training is still confronting several problems which are hampering its universal application. Lieutenant General Popov's article indicates several of these to include the following: the schools lack the adequate material base and knowledgeable specialists to organize and support the program; active duty military units and officers are not giving adequate "patron assistance" to these programs, i.e., military instructions, technical assistance in developing an adequate training facility, etc.; the program has been poorly popularized among the trainable youth; the program is not available throughout the Soviet Union; the Soviets are able to provide specialty training in but a few of the 400+ specialty fields currently included in the Soviet Armed Forces and in several cases they can offer only general or related training which will at least provide the individual with a basic skill level to work from, e.g., basic electronics, which would have general application to several technical specialties within the armed forces.<sup>13</sup>

The aim of this general pre-induction training program is to establish wherever and within the largest number of recruits possible a base (military and technical) from which a soldier with a combat specialty can be quickly trained. However, the number of recruits receiving this specialty training remains small (estimated by the Scotts at one out of every three)<sup>14</sup> and only a small proportion of the total specialties in the Soviet Armed Forces are even taught at this level.

Moreover, the military commissariats (draft offices) attempt to give consideration to the profession of the military technical specialty learned in school, and wherever possible, assign the recruit to a military unit where his knowledge and skill can be used.<sup>15</sup> However, this assignment is based on a general screening of the applicants and contingent upon direct draft quotas. In most cases actual duty specialty and assignment will be determined post-induction following another screening process at the podrazdeleniye. In the air defense units only the most technical maintenance specialists receive post-induction military schooling (up to six month programs). Attendance at one of these schools may entail an extended military commitment. The other soldiers arrive at the unit during either the spring or autumn induction period.

Another unique aspect of the Soviet system is that recruits arrive at the units with varying degrees of prior training: basic military skills, civilian training that may be related to a given unit specialty, and a level of military specialty training (DOSAAF).

Therefore, in most 'progressive' units an occupational-psychological screening of the young soldiers is conducted by a commission of the best trained specialists and the best officer-methodologists. "On the basis of specially developed tests and programs, the occupational suitability of soldiers for mastering any particular military specialty is identified. Efficient screening can significantly reduce the time required to train the young replacements."<sup>16</sup>

Based on this screening process individuals are selected for training in a specific service specialty and the 'training' level of each recruit is quantified.

This action also establishes the bases of the recruit's individual training record and another entry for the unit training records and charts. The recruits are then assigned to training groups, which are divided up where possible by skill level and training specialty. This may not be possible, however, in some cases because of training restrictions such as: the number of qualified instructors,<sup>17</sup> the availability of "material training base", and the number of recruits.

The Soviets' system of pre-induction training and post-induction selection processes have both been established in an effort to accelerate and reduce the training cycle required to produce a technically qualified soldier. For the air defense forces, with their complex and highly technical systems, it is extremely important that well-educated and technically trained personnel be integrated into combat crews in the shortest time possible.

## CHAPTER II

### TRAINING PROCEDURES AND TECHNIQUES

According to Lieutenant General of Artillery A. Khyupenen, then Deputy Commander-in-Chief of Antiaircraft Missile Troops of the National Air Defense forces, the training of air defense troops progresses through the following sequence: (1) Individual training of combat specialists, (2) Integration of the specialist into a combat crew and independent training of crews, and (3) Combined training sessions in the general system with all associated facilities.<sup>18</sup>

Analysis of Soviet publications indicates that the Soviet military leadership has developed certain training procedures and techniques that it feels will best service its needs in the training and development of air defense troops through the three-step sequence noted above. In this chapter, the most commonly discussed of these procedures and techniques will be outlined.

The planning and preparation of training programs must be carried out in accordance with the general guidelines of party and military documents on military and political training. These military documents stipulate what norms must be mastered for each specialty by the end of a designated training period. Further, these documents outline "what volume of material must be learned, what level of practice and skill must be acquired, in order to reach the end result; to gain a definite class qualification."<sup>19</sup> Therefore, these documents establish general guidelines and desired training results while leaving specific training program development to the commander of the podrazdeleniye.

It is then desired that lesson plans, or a program of instruction (skhema orientirovochnykh osnov devstviy [OOD]) be developed to support each of these training programs.<sup>20</sup> To aid the commander in the development and support of these training programs, he will establish a methodology council. The council is responsible to the commander and includes the most experienced and qualified methodologists within the unit (exact structure of the council is left to the discretion of the commander). They will aid the commander in preparing and supporting the training program.<sup>21</sup> One can only speculate on the effectiveness of this council system because of its dependence on acceptance by individual commanders and the availability of the experienced and motivated personnel (primarily officers) to support it.

The role of these councils has been receiving increased emphasis over the last couple of years in Vestnik PVO, and it is apparent that Soviet military leaders are looking to these councils to provide the expertise and guidance at unit level to alleviate some of the common problems affecting the development, implementation and operation of a successful training program.<sup>22</sup>

Some of these key problems that have received extensive criticism in Vestnik PVO are: (1) Utilization of inexperienced or unskilled instructors (specifically addressed towards the use of the junior lieutenant and sergeants in training classes, because they do not have the experience or technical expertise but are still required to train the troops); (2) The failure to develop a proper "training-material base" to support training requirements; (3) The continued application of outmoded training methods; and (4) The lack of proper application of training technology, i.e., simulators and other electronic training apparatus. The Soviets consider the "training-material base" to be all facilities, equipment, publications and other items which support the training effort.<sup>23</sup>

Toward this end, the methodological councils perform the following functions: prepare training programs; aid in the development of the "training-material base"; provide guidance and training to instructors; continuously evaluate training programs and their results; recommend changes and improvements in the application of new training methods and technology.<sup>24</sup>

The key to implementation of any of the specialty training programs is the development of the OOD, which is basically a program of instruction. Not unlike U.S. programs of instruction, they seek to establish a sequentially developed program divided into separate stages or units. Further specific learning goals are established for each development stage. These outline the standards of practical knowledge and skill that should be acquired within each training period (recommended length two months).<sup>25</sup> The Soviet air defense troops receive little theoretical training as emphasis is placed on practical training.<sup>26</sup> This is not necessarily a disadvantage as there are many critics of U.S. air defense training who feel that theory is over-emphasized.

A major element in the training program (both individual and by unit) of Soviet air defense troops, which seeks to support these programs, is the "training plan". The Soviets pay as much attention to the preparation of the "training plan" as to the overall exercise. "They (the training plans) require good preliminary preparation, both of the director himself and the trainees, and of sufficient logistical support."<sup>27</sup>

Any training plan, no matter if it is a daily, weekly or individual exercise plan must contain the following information: (1) theme, (2) date, (3) time of execution, (4) training goals, (5) problems to be solved, (6) personnel rosters, (7) list of equipment to be used, (8) (recommended) a list of exercise operational responsibilities by duty position and (9) test questions for evaluating the trainee's preliminary training. The commander is responsible for approval of all training plans. His aim is to ensure that each class is properly prepared and in support of the overall training program and its objectives.

The Soviets require of their commanders and instructors that all training plans be well organized and in proper sequence in order to follow the plan of stage-by-stage training. Stage-by-stage training is

a scientifically well-founded approach to planning of combat and political training and assumes a comprehensive consideration of all factors which guarantee the qualitative and proper completion of tasks which have been established to the fullest extent, the most expedient sequence considering experience acquired and recommendations of combat pedagogy and psychology; this makes it possible to effectively and in a shortened time train specialists for successful performance of functional obligations.... Great attention in the podrazdeleniye in being given the procurement of combat teams, selection and assignment of officer-leaders for conducting lessons, the thorough and objective analysis of specialists training. Lessons and training are conducted in accordance with a plan, with singleness of purpose, and considering the training level reached previously and the methodological methods to be used. From the first day practical work skills in the technology are imparted to the

new students. They are taught to function in a complex tactical situation. The sequence and intensity of lessons on the training firing range are carefully planned; this makes it possible to work out a problem with high quality and train specialists to carry out combat operations in a complex air situation.<sup>28</sup>

Stage-by-stage training is a sequential approach to the training process based on the premise of increasing the complexity of a learning situation only after the more basic situation or procedures is mastered. The Soviets place emphasis on practical training because they feel it is easier to monitor and evaluate, and it stresses the learning of combat skills and allows for more rapid transition to hands-on training with either a training apparatus or the actual equipment. Underlying this practical training is the principle of "do as I do" which looks to eliminate or greatly reduce most verbal and especially theoretical explanations and have the required procedure demonstrated.<sup>29</sup> This demonstration of procedure also reduces any confusions that could be caused because of language difficulties and also serves as a positive reinforcing tool for both the trainee and the instructor. For example, in Major Churilov's discussion of the application of this principle to the practical training of radar operators, he outlines three distinct processes or steps that are performed in the training of each operation. They are: (1) The trainee loudly reads the content (sequence) of the present operation and then completes it 3 or 4 times. (2) The trainee will then repeat the operation several times using an abbreviated form of the instructions. (3) The trainee will individually complete the entire operation without any instructions.

The trainees have the procedure reinforced several times as they observe one another go through this process. The instructor then evaluates the performance of each trainee and recommends specific individual training to support the development of the training goals.<sup>30</sup>

To support this type of program the instructors must continually monitor and evaluate the training progress of the trainees, and in some cases, the trainee's future activities may have to be planned on an individually self-paced training plan if he begins to lag too far behind the group.

Despite these factors, no matter what the individual soldier's job specialty, stage-by-stage development is considered essential in his training. "In the podrazdeleniye, people pay serious attention to the method of stage-by-stage formation of skills. This makes it possible to reduce the time required to train the recruit by about half and makes it possible for the novices to go on watch first as back-ups, then in the role of primary crew members."<sup>31</sup> Therefore, individual training plans (e.g., for a radar operator) will be increased in proportion to the individual's ability to master that segment of the training plan.

No one is allowed to move from one stage to another stage unless the individual has proven he has mastered the elements of that training stage. "An operator is not allowed to go on to training sessions under more complicated conditions until he has mastered the program at the individual training post."<sup>32</sup>

For the recruit, this introduction to the stage-by-stage training method may take place in special training platoons or groups created within the podrazdeleniye to facilitate the training of small groups of specialists. The commanders of these units are experienced educators and the best methodologists of the podrazdeleniye. They are supported also by several NCOs to aid in the instruction.<sup>33</sup>



The unit training point should be equipped with training radar stations and other apparatus as needed and the necessary number of screens and modern simulator-trainers. Here classrooms, laboratories and training control posts are created and are supplemented by a number of training aids, films and working models. If proper facilities are available, training can proceed realistically and with a minimal demand for access to operational equipment and therefore, a marginal impact on scheduled combat watch or high priority training.<sup>34</sup>

Combat watch is a recurring, rotational assignment. Most of the missile troops of the air defense forces are involved in combat watch which normally includes radar surveillance, monitoring the air situation and reporting of track data supported by an increased alert of the unit's missile system. This places an additional burden on the commanders and cadre of these units as they support the actual combat mission, the upkeep of their equipment and an on-going training program for the novices, soldiers and officers of the unit. If one believes Soviet propaganda, this added responsibility of combat watch stimulates a drive for excellence in training among the air defense troops.

Since Soviet air defense troops are tested daily on their gained knowledge, it is possible to accurately know the soldiers' level of proficiency at any given time. Not only is this an excellent training procedure, but it also allows for a gauge of when to integrate the novices into the combat crews.<sup>35</sup> At what point do the trainees possess the necessary theoretical and practical training skills to allow this integration with the least possible disruption of the units' on-going training effort and the least impact on the unit's overall combat readiness? The goal of the OOD training program is to insure that by the end of its designated training period, the missilemen will possess these desired standards.

The Soviets also consider side-by-side training to be essential in accelerating the training of the novice troops after their integration into a combat crew and also in stabilizing the combat readiness of the unit. This concept enables the unit to use the expertise of its specialists to share their knowledge and experience of equipment, procedures and operational drills with the new crew members. This concept is based on the principle "your experience should not retire with you."<sup>36</sup>

Since the majority of air defense troops serve only two years, training is being carried out and it is hoped that through this training approach, the more experienced troops will not leave the unit without imparting their knowledge to those who follow. The following comments by Lt. Col. A. Alekseyev indicate the Soviet view of this concept:

An experienced soldier or sergeant who is about to be discharged into the reserves considers it his duty to train a proper replacement. For this reason, the fact that more than 80 percent of our leading specialists first and second-class will leave for the reserves in the spring and autumn does not cause concern. Their place will be taken by dependable specialists who have been trained with their aid.<sup>37</sup>

The side-by-side approach also attempts to have a more experienced soldier monitoring the actual work of a new recruit and instructing on those points that must be reinforced and providing that additional data base that should permit a more rapid training growth for the novice, as he confronts the more complex technical and/or tactical situation. Thus, this approach avoids for the recruit what the Soviets call the "uncertainty barrier."<sup>38</sup>

Because of the complexity of the equipment and the collective nature of the air defense system, successful application of this training technique could be extremely profitable. However, it is dependent upon the willingness of a young soldier in the last couple months of his involuntary enlisted service to cooperate by providing that necessary expertise and training assistance. It seems certain that in some cases this technique will bear the desired fruit, but its overall effectiveness must be subject to question.

If it is determined during any stage of the training or operational stage that a crew member or trainee is lagging behind in the performance of certain operations, the supervisor should immediately investigate to determine if it is a repeated or consistent error.<sup>39</sup> One should then "...penetrate into the cause of the mistake more deeply, analyze its sources and take measures to improve individual educational work."<sup>40</sup> Therefore, the supervisor hopes to: (1) isolate the problem; (2) identify weaknesses or shortfalls in the individual's theoretical or practical training which need to be addressed; (3) establish a sequence of individual instruction or additional training sessions specifically directed toward correcting the training deficiency; (4) refrain from the principle of 'everyone at the same level'; and (5) follow up, continue to monitor the individual's training or duty performance, and if necessary, establish some side-by-side training assistance and support for the soldier.<sup>41</sup>

The Soviets not only use the stage-by-stage and the side-by-side approaches to training, but attempt to present approximate combat situations in all air defense training, i.e., emphasis on realism. The Soviets believe that by using electronic teaching aids and simulators great possibilities exist for more effectively raising the level of technical and special training (to be discussed later) of the air defense personnel. Due to the constant turnover in Soviet enlisted personnel, a need exists to quickly and effectively train these new soldiers, which supports a concomitant need for electronic teaching aids:

By their aid one can not only economize on the inventory of combat equipment and create a situation that maximally approximates the conditions of actual combat, but one can also objectively control and evaluate the actions of the students. Automated classrooms, electrical circuits, working models and stands, training movies and slides and television are also widely used.<sup>42</sup>

If the simulation equipment is of good quality and the operators are skillful in organizing and using it, the training can indeed be more profitable for the operators at all levels. The instructors can insure that simulated aircraft fly the types of missions needed to best support the training objectives and closely simulate target returns from the most logical enemy aircraft. Since these training devices can create near-perfect combat conditions, it is possible to view the reaction and work of each operator and air defense crew under varying degrees of combat complexity. Through the use of the simulator and periodic training support by military aircraft, commanders and instructors introduce and refine the operational capabilities of the troops to recognize and counter electronic counter measures (ECM) and gain a greater knowledge of the weapons of the enemy and his tactics for employment.<sup>43</sup>

The F-111 at high speed on the deck using terrain for masking, the B-52 at low or high altitude, mass formations of aircraft, the helicopter at low speed and

following the terrain and the pop-up target are given as examples of targets which can be simulated. This is all supportive of the Soviets' emphasis on the necessity of all personnel, but especially officers, to know their enemy, his equipment inventory, his flight characteristics and capabilities and his tactics of employment. The officer especially should know what to expect in given situations and learn to anticipate the enemy's action.<sup>44</sup>

If the officer knows his enemy and can anticipate his action, the officer can then aid his enlisted personnel in proper operational and tactical employment of the air defense system. In a complex and high speed combat air situation where seconds are important, this becomes ever more important.

The value of this teaching tool is dependent upon the quality of the simulators, the skill of the operators and the ability of the commander and instructor to make effective use of their unique capabilities. The often repeated criticism that commanders are weakening these training efforts because of their failure to develop an adequate "training-material base" and to use the new training methods combined with the number of articles extolling the value of these simulators to improve the effectiveness of training and shorten the required training cycle could well indicate the problems that the Soviets are having in educating their training cadres of the value of these tools and the most effective ways to utilize them in their training process.<sup>45</sup>

Much of the equipment that the Soviets classify as electronic teaching aids or simulators are developed by the training units themselves and does not have the level of sophistication nor the training parameters which have been indicated.<sup>46</sup> The Soviets have developed a sophisticated and multifaceted simulator station, but Captain Shumkor's article would indicate that this is based at division level only.<sup>47</sup>

An intrinsic part of the overall training program of any Soviet soldier is the critique. After every training exercise, a detailed critique is conducted, not only of the total outcome of the exercise, but also covering in detail the role of each air defense soldier in the execution of the mission and each soldier's duty performance. Using the detailed training plan already discussed, the commander analyzes each aspect of the exercise in view of the predetermined plan and the actual results. The Soviets extensively use recording and monitoring devices (e.g., recording equipment and cameras) as part of the information gathered during the training exercise. Using the results obtained from various electronic devices, the commander is able to not only discuss the results of the given exercise, but visually and orally to show what actually happened. This approach to the critique (visual and auditory) is felt by the Soviets to lessen the degree of subjectivity and also to serve as an excellent learning tool. The critique normally begins with the overall accomplishments of the training exercise as organized in the training plan. Next, the weaknesses of each segment of the training exercise are pointed out. The last step of the critique and the most important as far as the Soviets are concerned is an explanation of how to correct each aspect of all the weaknesses identified in the critique to include future training plans to correct them.<sup>48</sup>

In addressing a given training problem Colonel V. Kolesov indicated that "multiple repetition of separate operations and of the entire action with a subsequent critique of errors..." is the most rapid method to correct and strengthen the individual's training level.<sup>49</sup>

The air defense system is a collective weapons system, therefore, success in combat depends on the coordinated work of each individual in the combat crew and the crew as a whole. Because of this fact, it is imperative that specialists train and

drill many hours as a crew. To begin with, the Soviets feel that it is necessary to give the soldier an overall...

"familiarization with the equipment and organization of combat work on it. For this purpose, demonstrative classes are organized at which equipment is demonstrated with respect to its combat operation in which complex, tactical-technical data is revealed in totality, and the combat possibilities of the anti-aircraft missile weapon are exposed."<sup>50</sup>

The trainees will spend many hours then becoming familiar with: (1) the role of the crew or subsection within the air defense system; (2) the nature of the crew's interface with other sections and the data reports that are submitted to and from these sections; (3) the individual operator specialist's role in this; (4) governing operational and tactical documents, and (5) unique organizational terminology.<sup>51</sup>

The trainees then are integrated into a crew and the next stage of training is addressed toward satisfying the operational standards as a crew. The stage-by-stage and side-by-side training techniques play an important role here as basic attention is given to the quality of the accomplished operations and the clarity of commands and reports submitted. This is the stage at which good crew practices must be established and reinforced. "Each time, immediately after satisfying the (crew) standard, the commander makes notes and, if there are mistakes, shows how one should accomplish this method correctly."<sup>52</sup> Once the crew drill has been adequately mastered and performed within the standard, the crew is ready to begin more complex training, i.e., combined training and tactical training.

The primary tasks of combat and political preparation, training, and education, according to Colonel General of the Artillery I. Gurinov are: (1) to have "...each collective form and blend into a unitary whole;" and (2) to teach the soldier that which is required in combat, that which is necessary for accomplishing the military mission, and prepare him physically, psychologically and professionally with the experience and skill to meet any combat situation.<sup>53</sup> Therefore, the success of this military training is seen to also depend upon the development and organization of those types of exercises and missions which ensure a high level of coordination of crews and podrazdeleniye; for operation under the most complex conditions of the air and ground situation. It is particularly important to ensure that these training exercises are based upon realistic plans, correspondent to the attained level of personnel training and to the assigned mission.

Through the combined training lesson or method (depending on the author) the Soviets look to: (1) develop training problems in which two or more training subjects which are closely inter-connected, are worked out in a specific tactical situation;<sup>54</sup> (2) use a single training plan against a specific tactical background to train simultaneously soldiers of nearly all specialties and crews within the podrazdeleniye; and (3) reduce the overall preparation required and insure that all crews receive a uniform training base, thus precluding some future operational conflicts.<sup>55</sup>

The tactical exercise combines all training and creates the greatest sense of combat reality. In this type of exercise, all elements and actions of the air defense podrazdeleniye are put together as the unit seeks to fulfill its primary goal of destroying the enemy aircraft. This goal is achieved by tying together the systems functions of: aircraft detection, identification, target/track designation and assignment, target track, missile launch and target kill. Therefore,

"the basic purpose of the tactical exercise is to develop the means and methods of combat control and joint combat actions of the air defense missile podrazdeleniye."56

Through the use of live targets or electronic simulators the Soviets seek to develop an air situation which closely resembles actual combat, using the probable enemy's maneuvers and tactical methods and the application of varied jamming techniques. These techniques are further supplemented by the use of the "hypothetical situation" which is used to simulate such combat disasters as: (1) nuclear or chemical contamination; (2) aircraft or missile attack on the installation causing the loss or damage to equipment and loss of crew or officer personnel; (3) loss of communications with higher headquarters elements; and (4) all situations necessitating officer and operator actions to allow the unit's continued combat operation.

Recognizing the priority nature to the enemy of the air defense systems and the vulnerability of these systems, the Soviets have further accentuated: (1) the need for extensive personnel and officer cross-training to insure that personnel losses can be replaced; (2) systems and procedures to back up the automatic processing systems and other communications systems; (3) ongoing training on the use and operation of the system in a degraded status due to equipment outages or loss.

According to Colonel General I. Gurinov,

the intent of the (tactical) exercises...provides for the necessity of acting in an unfamiliar, sharply changing situation, with an acute shortage of time, the presence of incomplete and contradictory data on the enemy during the enemy's use of maneuvers and tactical methods. At exercises and classes, automated control systems, computer technology and modern communication facilities are widely employed. All of this permits the commanders, officers, plotting personnel of command posts, and all other personnel most fully to sense the nature of modern warfare with the airborne enemy, to use their combat equipment and weapons with maximum effectiveness.<sup>57</sup>

Another aspect of Soviet air defense training is competitiveness. Elements of competitiveness are used throughout the air defense forces at any and all levels of training or operational sections. This sense of competitiveness is enhanced...

by the competition between the leading specialists and crews for the purpose of ascertaining the level of the men's special training and for raising their practical skills in combat work. In the course of these contests, it is possible to determine the best operators and crews, as well as the advanced procedures for training operators, men and crews. Ways and opportunities are sought throughout for reducing the time required to carry out the combat norms, while the experience of the best is disseminated. For encouraging the victors, the Soviets have established the pennants: Best Unit-Operator; Best Unit-Electrical Mechanic; Best Unit-Crew, and others.<sup>58</sup>

This type of inter-unit competition is supplemented by an annual nationwide

program of socialist competition. This program aims to stimulate both individual and unit drive toward higher indicators of combat readiness. Through this program, the individual is evaluated based on: established military, technical and political norms for his specialty and the soldiers' or officers' time in service; and the individual's degree of completion of specific tasks he committed himself to at the beginning of the year, e.g., to become proficient in one additional specialty or raise one's specialty skill level to that of a First Class Specialist. The unit and the commander are rated on: (1) the ability of the unit to accomplish assigned goals, (2) the percent of specialists within the troops and officers of the unit, (3) the proficiency of the unit displayed during tactical exercises and weapons firings, and (4) overall combat readiness of the unit.

These unit goals for socialist competition are established at the Ministry of Defense level and outlined as annual training pledges and challenges by the military leadership of each branch of the armed forces. The emphasis placed on this competition is reflected in the following comments by General Secretary of the Communist Party L. I. Brezhnev:

Socialist competition, being a vital creative mass, requires not only the active support and reward of progressive people, but also the identification of those who lag behind or who do not labor with sufficient sincerity. And this should be done publicly, clearly, so that people not only know about those who work with complete application of effort, but also about those who work with a grudge, without effort.<sup>59</sup>

. Thus, it is hoped that this continuous competition will allow the officers or commanders to accurately determine the contribution of each soldier toward the unit's overall combat readiness; will attract attention to the achievements of advanced soldiers and in a professional fashion will ensure comradely assistance, mutual control, and the capacity to repeat the best methods. As Brezhnev pointed out, this approach to the competition also aids in timely identification of those personnel who do not keep their word (pledge), who lag behind, and who thereby hold back the collective. This then makes it possible to take timely and, hopefully, appropriate countermeasures. To support this type of program, the results (positive and negative) must be regularly cited.<sup>60</sup> To this end, the units strive for the red banner and recognition as an "outstanding" unit.

The Soviet combat qualification system is interwoven with this program of Socialist competition. Through this proficiency rating system, soldiers and officers compete for Third, Second, First, and Master class ratings. Missilemen who have successfully completed their specialty training and received a grade on the test will earn their Third Class rating. This is one of the desired training objectives of all OOD training programs. Those who receive an unsatisfactory grade will receive further training and be retested.<sup>61</sup>

Each specialty has its own established examinations, which evaluate the individual's theoretical and practical skills in any one of the given rating levels. These examinations are given semi-annually at the end of the winter and summer training periods. Certificates and badges are awarded to those who pass the examinations. After a period of five months, those who have failed to qualify can be retested.<sup>62</sup> The higher the rating level, the more in-depth knowledge one must have on his own specialty and for the two highest skill levels, one must also have a demonstrated knowledge of a related specialty, and have performed well in political training.<sup>63</sup>

This is once again an incentive to gain greater combat proficiency and operational expertise. It is used as an indicator of a soldier's training level and to rate

the quality and effectiveness of the training program, and in turn, the unit's commanding officer. Soldiers and sergeants with second-class ratings and higher are also paid a nominal amount of proficiency pay and are more favorably considered for promotion.<sup>64</sup> For the officer, of course, a master's rating is a very positive indicator of the individual's job competence. All personnel who earn second-class ratings or higher must reconfirm these ratings once a year.

The Soviets feel that the key to combat readiness and combat effectiveness is people who are properly trained in the operation and maintenance of their equipment. The key to the establishment of such a base is the officer who has the methodological skills, plus the mastery of the operation, maintenance and tactical employment of the system, to support the training effort. As it has been shown, the Soviets use such techniques as stage-by-stage and side-by-side training to support the development of a strong training base for their personnel. Soviet literature puts great emphasis on the need for all personnel to have an in-depth knowledge of equipment, its operational procedures, the nature and tactics for systems employment, the enemy (his systems and methods of tactical employment), and the most probable "nature of combat", nuclear or chemical contamination. To support these needs all combat training should be well planned and directed toward specific training goals; considered as a cumulative process with today's training lesson based on the training level of the soldier and leading toward tomorrow's stage-by-stage training; tailored to the individual; as close to combat reality as possible; crew-oriented to develop the necessary levels of coordination among crew members and with other subsections; dynamic, variable and high speed, avoiding stereotyping the training problems and ensuring that each problem is a learning process and does not serve to lull the operators into a false sense of security.

The importance of this training is further emphasized by the continuous drives to upgrade and modernize the process. The aims of these actions are to increased speed and quality of training. The unique nature of the Soviet enlisted service system and the dynamic and complex nature of the air defense system and air combat further make it imperative to employ a training process that will rapidly produce professionally competent personnel to assume combat positions and to continue ongoing combat and tactical training to upgrade and reinforce these tactical skills.

### CHAPTER III

#### MAINTAINING EQUIPMENT

Lt. Col. A. Alekseyev, chief of a regimental political department, states that "the missiles can be used with maximum effectiveness only by a person who has thoroughly studied the equipment, who can maintain and operate it ably, and who has mastered the methods of combat work completely."<sup>65</sup> Thus, as Lt. Col. Alekseyev noted, personnel must be devoted to thoroughly studying missile equipment in order that they know how to utilize the operational capabilities of the equipment to its utmost, and must be inculcated with the skills, procedures and habits necessary to maintain it in a constant state of combat readiness. The combat readiness of each antiaircraft unit cannot be rated by the level of training and the expertise of the operator personnel alone, but is also contingent upon the optimum performance of the unit's equipment.

Practice has shown that even the latest equipment can malfunction if the personnel violate the rules established for each type of equipment and for utilizing it. Various malfunctions, deviations of parameters from the standard, mistuning of individual units, and mis-adjustments, all these things in the final analysis mean that the division is not ready for combat whenever there are shortcomings in servicing its equipment.<sup>66</sup>

The responsibility for the combat readiness of equipment is laid upon the officers, once again emphasizing the importance for the officer to know in detail his equipment. Technical training is an area that receives considerable emphasis for the junior officer in the Higher Military Academies and during his initial training sessions within the unit. It is further a subject for continuous review during officer training sessions and seminars within the podrazdeleniye and a topic that each officer should pursue during his continual process of self-education. From the Soviet perspective, officers must not only be thoroughly familiar with combat equipment, they must constantly update that knowledge; as former Defense Minister Marshal Grechko pointed out, "the only officer capable of keeping in step with the times is the one who is always studying, who is constantly increasing his knowledge, and who makes skillful use of that knowledge in his practical activities."<sup>67</sup>

With this training base the officers must then train their missilemen to insure that they have the necessary knowledge and develop well established habits to support a continual process of equipment monitoring and maintenance. Equipment safety, plus the importance and nature of the pre- and post-operative checks are training subjects that are emphasized and reinforced continuously from a soldier's first day of introduction to the equipment. "The soldiers must be trained to respect their equipment and instilled with a proper attitude toward their responsibility for the proper operation and maintenance of that equipment."<sup>68</sup> Major Churilov further feels that it is most important to establish the proper training base early because it is much more difficult to retrain these soldiers.

However, for Engineer Col. Ya. Rayemov

the secret in the work of officers in this podrazdeleniye consists of the fact that they make their checks not from



case to case, but rather everyday on the timeliness and quality with which all types of preventive measures are carried out; they check the storage and maintenance of combat equipment, carefully analyze the results of utilizing it in the most recent training period, and undertake measures in time to prevent possible malfunctions.<sup>69</sup>

This emphasis placed on the role of the officer in the training, performance and monitoring, and his overall responsibility for the maintenance of all equipment is aimed at insuring that training and combat failures are not caused by a faulty cable connection, mis-tuning of a radar, the failure to properly align a radar scope, a dirty panel connection, etc., in other words, operator failure.<sup>70</sup>

In order to support the officers and operators in the performance of their monitoring and maintenance function, the division usually develops plans and charts which outline normal operator maintenance procedures and provisions for minor repairs or adjustments. These charts indicate what should be available (spare parts, safety equipment, etc.) and what jobs must be completed before a certain operation is carried out, and what the officers, NCO's and soldiers must know and perform in accordance with their functional duties.<sup>71</sup>

A procedure has been established according to which personnel take up their working positions (combat conditions permitting), make their equipment checks and carry out necessary repair and maintenance operations according to the charts and plans. However, Col. Fayemov emphasizes once again that "during this time the officers not only tune and check the equipment themselves, but also check the work of their subordinates and insure that they do not allow mistakes in measuring the parameters and that they carefully assemble the units, assemblies, and systems as a whole."<sup>72</sup>

All these procedures must be supported by an ongoing training program for both officers and operators supported by division officers and technical service officers. One goal of this program is to explain to personnel the content and intent of the measurements of operational parameters. Another goal is to teach them to detect the slightest operational deviations and other keys toward the forecasting of equipment problems.<sup>73</sup>

Quarterly competition is also used to stimulate personnel to take an active part in status surveys of their equipment. The aims of this competition are to improve the quality with which the equipment is utilized and maintained, and to motivate the personnel to attain even better results in repair operations and equipment servicing. Individuals, teams, and units are cited for their accomplishments and given awards and decorations.<sup>74</sup>

Why this tremendous effort toward publicizing the need to train and motivate the missilemen to assume greater responsibility for the upkeep of their equipment? It seems apparent that the Soviets do not feel that their soldiers have either the skill level or the necessary motivation to place the responsibility for this operator level of maintenance (first echelon maintenance) in their hands. This is a procedure that is normally accepted in the U.S. as being the responsibility of the given operator and his section NCO, and periodically the duty officer will spot check their work. However, the Soviet officer feels he must be more deeply involved and technically qualified to insure that his subordinate personnel are performing all technical checks, operations and minor maintenance as prescribed.

The comments by two battery commanders, Captains V. Polovinkin and V. Kushchev in their discussion with Colonel N. Kiryukhin give some insight into the depth of the problem.

Captain V. Polovinkin: '...I have been convinced so often that it is easier to train soldiers to fire... than to see that they have a good knowledge of the equipment design and are able to maintain it properly. For everyone knows that our weapons are very complicated. And if there are failures on the range, it is usually because of mistakes made by the crews.'<sup>75</sup>

Captain V. Kushchev: 'In analyzing the malfunctions which occurred in the battery, I can say that all of them appeared because you yourself were not able to see that crews strictly followed rules for equipment maintenance and operation, to see that they performed maintenance on time and with high quality, and to ensure that they kept an eye on the wear and deterioration of individual parts and assemblies of the equipment and on any change in their operational parameters.'<sup>76</sup>

As noted earlier, the air defense system is a collective weapons system. In order to insure that the system operates at its maximum level of combat readiness and effectiveness, all equipment as well as all personnel must perform within required parameters. The complex and sensitive nature of most air defense equipment necessitates the high priority given to all levels of maintenance and equipment monitoring. Minor equipment malfunctions or improper equipment adjustment (mis-tuning) at any level can have a degrading effect on the system's overall operation or in fact, cause a non-operational status. Therefore, not unlike ourselves, the Soviets place great importance on the training of all personnel to perform these functions. Because the Soviet officer does not have the luxury of a highly experienced NCO corps or senior operators that can be trusted to assume this responsibility, the burden for equipment maintenance falls on him.

## CONCLUSIONS

From this analysis based on Soviet military publications it is apparent that the training system, procedures and techniques the Soviets have developed are directed against two critical problems confronting them: TIME--the need to maximize the effective training value of every minute and to reduce wherever possible the training time required, and QUALITY--the need to improve the quality of all training, its uniform application and the ability of established training programs to support the maintenance of maximum levels of combat readiness and combat effectiveness. The former Commander-in-Chief of the National Air Defense Forces Marshal of the Soviet Union P. F. Batitskiy clearly emphasized these points in the following quote:

The increase in complexity and intensity of modern warfare and the associated requirements made upon combat training require an unswerving elevation in the quality of training and in the effectiveness of every hour of classes. This is achieved through perfecting the forms and methods of training, improving the training-material base, and through the extensive use of electronic simulators and training devices. What is very important is that every class be conducted under conditions that maximally approximate combat ones.<sup>77</sup>

- For the Soviet air defense forces, one of the major challenges they must face is how they can get the maximum training result out of the shortest period of time. Better than 80% of the Soviet enlisted personnel assigned to the air defense forces spend no more than their two years of mandatory service. In comparison, all air defense specialties in the U.S. Army require a minimum enlistment period of three years. This overview of the Soviet air defense training process has attempted to show how the Soviets address these challenges. The conclusions will review the effectiveness of this process and note several of the major differences which exist between Soviet and American approaches.

The Soviet system of pre-induction training has been successful in providing all Soviet youth with a basic level of military training; however, the Soviets have had far less success in providing the specialty training programs desired. The Soviets have had significant success in establishing excellent pre-induction training programs for several military specialties, as noted earlier in the paper. However, the upgrading of this program to include quality training in a greater number of military specialties, involving significantly more of the youth than the approximately one-third of those called up, and the establishment of facilities throughout the Soviet Union would require a tremendous commitment in money, equipment and manpower. Even with the political and monetary commitment of the Soviet leadership to support the upgrading of this program, they have neither the available equipment (material-training base) nor the manpower (training expertise) to significantly upgrade this program in the foreseeable future. What the Soviets may have to do is isolate given critical specialties and establish the training facilities and cadre to support the training of selected youth in these fields, as the Soviets have done with flight training.

The Soviets' approach toward the active duty training of air defense troops in several respects is significantly different from the U.S. Although they do use many of the same training techniques and procedures, they do differ in their manner of applying these.

Both Soviet and U.S. training programs use a similar training sequence for developing the recruits' combat skills, but there is a significantly different approach to where and how this training is to be accomplished. The table below highlights several of these major differences.

#### NATURE OF SPECIALTY TRAINING PROGRAMS

<u>Type of Training</u>	<u>Nature of its Conduct &amp; Development</u>	
	<u>Soviet</u>	<u>U.S.</u>
Individual	decentralized	centralized
Crew	decentralized	centralized introduction decentralized refinement
System	decentralized	decentralized
Development of POI (Program of Instruction)	decentralized based on general guidelines & goals	centralized
Primary instructor support	officers	NCO's, WO's

In the context of this paper centralized refers to a major training command that provides for the development of training programs and the conduct of training and decentralized refers to the accomplishment of these processes at lower levels within the military structure.

The establishment of a centralized training program and the operation of central training facilities do have some very definite benefits that the Soviets are losing. For example, every air defense soldier of a given specialty would receive the same initial training program, therefore, establishing a uniform program of instruction and reducing the training load placed on individual combat units. It would also reduce the number of training programs they would have to support with "sophisticated training equipment" (i.e., electronic trainers and simulators), and experienced instructors. It is also much easier to insure that the newest training techniques and equipment are used and to control the quality and period of training. For the Soviets this uniformity in the quality and nature of air defense training is difficult to control and to support. It is also a problem that is much discussed in Soviet military publications and it is through these publications that they hope to provide methodological assistance and support to the combat units that are running these training programs. The Soviets are also looking to the methodological councils at podrazdeleniye level to provide expertise to the preparation, operation, monitoring and upgrading of these programs. They are looking to increase the importance and role of these councils throughout the Soviet military and the Soviet military has begun to conduct regional and national branch-related seminars to aid these councils in their training function. Still remaining, however, is the tremendous drain placed on the combat units, as they balance their resources between support of their combat watch, combat readiness requirements and their training requirements. Criticisms noted in Vestnik PVO

indicate that the units are having problems supporting the training effort with adequate numbers of qualified officers and an adequate or modern material-training base. Part of this problem seems to rest on the fact that junior officers and NCOs play a limited role in the training process because most Soviet military leaders do not feel they have either the methodological or technical expertise or experience to perform this function. To rectify this situation most Soviet military organizations have established their own instructional programs and self-study programs.

In reviewing the types of training techniques and devices the Soviets use, it is clear that in many respects they are similar to those used in the U.S.; however, there are several differences in the manner and means of their use. For example, stage-by-stage is a generally used training technique, which is used by both to support the development of logical programs of instructions (POI) and in their implementation. In the implementation of the POI, stage-by-stage is used as a training technique and a control measure as the soldier progresses through the various stages of training. Differences do exist, however, in the training emphasis placed on theoretical or practical training. For the Soviets the key is "do as I do", therefore, the instructor demonstrates and the student repeats the action. The Soviets also, through such an approach, seek to simplify the training process and to shorten the training cycle (time) by emphasizing only those practical skills that are necessary for the performance of the individual's combat duties. It would also reduce the importance of the trainees' language ability. However, this technique has been criticized for its lack of flexibility and strict adherence to the POI.

Side-by-side training is once again not a technique that is unique to the Soviets, however, the U.S. does not consciously place such importance on this technique and on its cost benefits. Also, it is doubtful if the U.S. would place such an important training role on soldiers with less than two years of service and with questionable levels of technical expertise and instructor skills. Also, if assistance is not given by someone comparable to a senior specialist or NCO in the U.S. context or if the program is not continuously monitored in the most critical manner, control of the quality of training may well be lost.

The value to any such training program of simulators cannot be questioned, and they are seen as a means to improve the quality of instruction and to allow the reduction of the training cycle period. However, criticism in Soviet military publications would indicate that these simulators and electronic training devices are not used in all training units because of their nonavailability or the units' inability to utilize these training devices; and where used there has been considerable criticism of their misuse or abuse by instructors who do not understand the full capabilities of these devices or know how to properly use them.

Unit competition, socialist competition and proficiency testing are all incentive techniques used by the Soviets in an effort to stimulate greater interest and emphasis on quality training, and also as a yardstick to rate the training effectiveness of units and the training skill level of each unit, crew and individual specialist. The Soviets seem to have good results using these incentives as the units and individuals strive for the recognition and rewards "EXCELLENCE" brings.

In the Soviet air defense forces there appears to be greater emphasis placed on the following: (1) The Threat--they seem to spend much time analyzing the tactics and equipment characteristics of the most probable threat, and incorporating these into crew and systems training (e.g., flight scenarios simulating the most probable attack route, aircraft speed, altitude, Electronic Counter Measures (ECM) levels, etc. of U.S. B-52 aircraft); (2) Psychological Preparedness--the Soviets go to

much greater lengths to ensure combat realism and the preparation of the individual and the crew for such eventualities as fire, nuclear attack, chemical attack, equipment or personnel losses (the hypothetical situation and emphasis on cross-training) and the sounds of an air battle; (3) The Critique--the Soviets have a much more formal approach to the use and the value of the critique as a training tool. It is used to positively reinforce good training and operational practices, identify mistakes and outline what is the proper action and training requirements or procedures to correct these; (4) Soviet Officers--are expected to have a far greater knowledge of general systems operation, equipment and maintenance, plus the duty requirements and procedures for all subordinate personnel/duty positions; and (5) Training Roles--the Soviets place much greater emphasis on the importance of the officer as the conductor of most, if not all, of the individual, crew and systems training. The overall role and responsibility of the NCO is much different than in the U.S. military, because of the limited level of experience, training, and technical expertise that most of these Soviet NCOs possess.

There is a similar attitude toward the training of operator personnel which emphasizes the importance of their maintenance role and the need to establish proper procedures and habits to ensure that they are supporting the maintenance effort. However, there is a completely different attitude toward the role of the NCO and operator and in the amount of responsibility they are allotted. For the Soviets the officer is expected to be much more knowledgeable and much more involved. Rather than simply monitoring and spot checking the procedures they are expected to be deeply involved in the actual performance.

This is not to suggest that the overall training of the air defense troops for combat is poor. It is true that their training system is greatly hampered by several of the factors discussed in this paper, however, many of these training weaknesses are overcome by constant training effort, repetition and rote drill and response to those situations they have trained for, however, it is unclear how they will respond to the unexpected. In those cases the burden will once again fall upon the officer who has the "overall knowledge of the system, its operation and tactical employment".<sup>78</sup>

## ANNEX A

### SOVIET AIR DEFENSE FORCES

The Soviet air defense forces are divided into two major categories: Voyska Protivovozdushnoy Oborony Strany (National Air Defense Forces) and Voyska Protivovozdushnoy Oborony Sukhoputnykh Voysk (Air Defense of the Soviet Ground Forces).

#### Voyska Protivovozdushnoy Oborony Strany--PVO Strany

The Soviet National Air Defense Forces are currently commanded by Marshal of Aviation A. I. Koldunov and are the second largest of the five Soviet military services. There are currently more than 550,000 personnel assigned to the PVO Strany, which is divided into two air defense districts, Moscow and Baku. There are three basic components of the PVO Strany: (1) Istrebitel'naya Aviatsiya PVO--IA PVO (Fighter Aviation of the National Air Defense Forces); (2) Zenitnyye Raketnyye Voyska--ZRV (Surface-to-Air Missile Troops of the National Air Defense Forces); (3) Radio-Tekhnicheskiye Voyska--RTV (Radio-Technical Troops of the National Air Defense Forces--this is radar and communications). There are currently more than 2,500 interceptor aircraft assigned to the IA PVO. The ZRV currently man approximately 12,000 surface-to-air missile (SAM) launchers deployed on approximately 1,650 sites. The RTV operate more than 5,000 surveillance radars located throughout the Soviet Union. The mission of the PVO Strany is to prevent enemy aircraft or missile penetration of the Soviet Union.

#### Voyska Protivovozdushnoy Oborony Sukhoputnykh Voysk--PVO SV

The Air Defense of the Soviet Ground Forces is one of the four major branches of the Soviet Ground Forces and is currently commanded by General Colonel of Artillery P. G. Levchenko, who is Chief of the Air Defense Troops for the Military Council of Command and Staff of the Ground Forces. The PVO SV has three basic components: mobile gun systems, mobile SAM systems, and radar and communication systems. The units of the PVO SV are not part of the National Air Defense Troops, but are rather assigned to major branches of the Soviet Ground Forces and subordinate to the Ground Force commander. The mission of the PVO SV is to defend Soviet troops in the field from air attack.

ANNEX B

TABLE OF COMPARATIVE MILITARY RANKS

<u>Soviet Union</u>	<u>United States</u>
Marshal of the Soviet Union	General of the Army
Chief Marshal of (Artillery)	*****
General of the Army, Marshal of Aviation, Marshal of Armed Forces, Artillery, Engineers, etc.	General
Colonel General	Lieutenant General
Lieutenant General	Major General
Major General	Brigadier General
Colonel	Colonel
Lieutenant Colonel	Lieutenant Colonel
Major	Major
Captain	Captain
Senior Lieutenant	*****
Lieutenant	First Lieutenant
Junior Lieutenant	Second Lieutenant



## FOOTNOTES

1. Major General of Artillery A. Samoylov, "I kontrol', i pomoshch'," Vestnik Protivovozdushnoy Oborony (hereafter Vestnik PVO), No. 3 (1977), p. 26. Author's note: a podrazdeleniye is a subunit of Battalion size or below, which is of permanent and homogeneous composition.
2. "The Methodological Training of Officers, Vestnik PVO, No. 7 (1975), p. 2. (translated by US Army Foreign Sciences and Technology Center; hereafter FSTC)
3. Lieutenant General of Artillery A. Khyupenen, Deputy Commander-in-Chief of Antiaircraft Missile Troops of the National Air Defense Forces; "Taking the Combat Mission into Account," Vestnik PVO, No. 10 (1977), p. 25. (translated by FSTC)
4. Colonel General of Artillery I. Gurinov, Commander Antiaircraft Missile Troops of the Air Defense Forces of the Country, "Kachestvennyye pokazateli takitcheskoy vyuchki," Vestnik PVO, No. 1 (1976), pp. 31-36.
5. "The Technical Subject: Successes and Failures--Contents of Military Journals Evaluated," Krasnaya Zvezda, 3 December 1978, p. 2. (translated by JPRS)
6. "Increases in the Quality of Combat Training," Vestnik PVO, No. 3 (1975), p. 5. (translated by FSTC)
7. Harriet Fast Scott and William F. Scott, The Armed Forces of the USSR, Boulder, Colorado: Westview Press, 1979, p. 316; Herbert Goldhamer, The Soviet Soldier: Soviet Military Management at the Troop Level, New York: Crane, Russak and Company, Inc., 1975, pp. 39-55; and Lieutenant General A. Popov, Chief Directorate of Military Training for Civilians, Ministry of Defense of the USSR, "Training Youth for Service," Tekhnika i Vooruzheniye, No. 11 (1975), pp. 18-19. (translated by FSTC)
8. Scott, p. 309.
9. Popov, p. 18.
10. Scott, p. 309-310.
11. Popov, p. 19.
12. Goldhamer, pp. 55-56, and Popov, p. 18.
13. Popov, pp. 18-19.
14. Scott, p. 309.
15. Popov, p. 18.
16. This process is outlined in greater detail by Major A. Churilov, "Podgotovka operatorov v nachal'nyy period obucheniya," Vestnik PVO, No. 6 (1978), pp. 54-55.
17. Lieutenant Colonel of Engineers A. Polyakov, "Uchebnyy den' kakova ego otdacha?," Vestnik PVO, No. 5 (1979), pp. 40-43; Colonel I. Dokuchayev,

"Chtoby ne gasla initsiativa," Krasnaya Zvezda, 21 February 1980, p. 2; and Lieutenant Colonel V. Filatov, special correspondent, "Komandir videt dal'she," Krasnaya Zvezda, 10 February 1980, p. 2.

18. Khyupenen, p. 25.
19. Lieutenant General A. Voronin, Chief Radio-Technical Troops Moscow District PVO, "Planirovaniye i knotrol' podgotovki operatorov," Vestnik PVO, No. 5 (1978), p. 52.
20. Voronin, pp. 52-53; Churilov, pp. 54-57; and Major Vasil'ev, "Po novoy metodike," Vestnik PVO, No. 7 (1979), pp. 48-51. In these articles the nature of the development and the desired intent of this program is outlined
21. Major General of Aviation A. Kurinnyy, "Povyshat' rol' metodicheskikh sovetov," Vestnik PVO, No. 7 (1978), pp. 29-33. This article outlines in detail the preferred structure and operation of these councils.
22. Ibid., pp. 30-31, and editorial, "Boyevoy podgotovke-vysokoye kachestvo u effektivnost'," Vestnik PVO, No. 1 (1979), pp. 3-6.
23. Lieutenant Colonel V. Getmanyuk, Commander Radio-Technical Battalion, "Uchebno-material'naya baza i vyuchka lokatorshchikov," Vestnik PVO, No. 9 (1979), pp. 47-50.
24. Kurinnyy, pp. 29-33.
25. Churilov, pp. 54-55, and Voronin, pp. 53-54.
26. Churilov, p. 55.
27. Major General of Artillery V. Mikhalkin and Colonel A. Sidorenko, "Complex Training Practice," Voyenny Vestnik, No. 3 (1977), p. 29. (translated by JPRS)
28. Lieutenant General of Artillery A. Smirnov, "Most Important - The Quality of Combat Training," Vestnik PVO, No. 2 (1976), pp. 24-28. (translated by FSTC)
29. Churilov, p. 56, and Goldhamer, pp. 106-107.
30. Ibid.
31. Lieutenant Colonel V. Obukov, "V raketnom dozore," Vestnik PVO, No. 4 (1977), pp. 22-23.
32. Lieutenant Colonel L. Bulat and Lieutenant Colonel A. Zakhorenko, "The Large Capabilities of 'Small Technology'," Krasnaya Zvezda, 6 March 1979, p. 2. (translated by JPRS)
33. Major General A. Intse, Chief of Combat Training of the Radio-Technical Troops of the Air Defense Forces of the Country, "A Progressive Method for Training Radar Personnel," Vestnik PVO, No. 10 (1976), p. 41. (translated by FSTC)
34. Ibid.

35. Churilov, p. 56.
36. Lieutenant Colonel A. Alekseyev, "The Main Goal - Combat Readiness," Vestnik PVO, No. 3 (1973), p. 35. (translated by FSTC)
37. Ibid.
38. Lieutenant Colonel A. Polyakov, "So That Accuracy Will Be High," Vestnik PVO, No. 12 (1976), p. 39. (translated by FSTC)
39. Major C. Sverdlov, "Intensification of the Training of Young Launch Personnel," Vestnik PVO, No. 1 (1976), p. 37 (translated by FSTC), and Major P. Chenyak, "Vospityvat' kazhdogo vojna," Vestnik PVO, No. 3 (1977), p. 24.
40. Chenyak, pp. 24-25.
41. Sverdlov, p. 37, and Chenyak, p. 24.
42. Colonel L. Ambrosov, "The Effectiveness and Quality of the Training Process," Vestnik PVO, No. 7 (1976), p. 23. (translated by FSTC)
43. Captain A. Shumkin, "Maksimal'no ispol'zuyem vozmozhnosti imitatorov," Vestnik PVO, No. 4 (1979), pp. 54-56, and Major General H. Polyakov, Chief of Staff of the Radio-Technical Forces PVO of the Country, "V predvidenii deystviy vozdushnogo protivnika," Vestnik PVO, No. 4 (1978), pp. 47-51.
44. Ambrosov, p. 22.
45. Major General H. Polyakov, Chief-of-Staff Radio-Technical Forces PVO of the Country, "Povyshat effektivnost' trenirovok lokatorshchikov," Vestnik PVO, No. 2, (1979), pp. 32-36; Shumkin, pp. 54-55; and "Boyevoy podgotovke vysokoye kachestvo i effektivnost'," pp. 4-5.
46. Filatov, op.cit.
47. Shumkin, p. 54.
48. Samoylov, p. 27.
49. Colonel V. Kolesov, "Training Launch Personnel in the Fall-Winter Period," Vestnik PVO, No. 9 (1976), p. 41. (translated by FSTC)
50. Kolesov, p. 40.
51. Ibid.
52. Ibid.
53. Gurinov, pp. 31-36.
54. Colonel S. Bulyzhkin, "Combined Lesson with an Antiaircraft Battery," Voyennyy Vestnik, No. 8 (1977), p. 98. (translated by JPRS)
55. Lieutenant Colonel V. Sadykov, "Kompleksnaya otrabotka takticheskikh zadach," Vestnik PVO, No. 7 (1977), p. 26.

56. Lieutenant General S. Vikhor, "Increase the Effectiveness of Tactical Exercises with Live Firing at the Range," Vestnik PVO, No. 7 (1975), p. 40. (translated by FSTC)
57. Gurinov, p. 36.
58. Alekseyev, p. 35.
59. Lieutenant Colonel N. Rumyantsev, "To the Completion - Clarity, Comparability, Effectiveness--An Important Stimulus of Growth of the Professional Mastery of Officers," Vestnik PVO, No. 3 (1976), p. 20. (translated by FSTC)
60. "Increase the Quality of Combat Training," p. 5.
61. Harriet Fast Scott, "Universal Military Training in the USSR," Air Force Magazine, March 1978, pp. 86-87.
62. Ibid., p. 87.
63. Rumyantsev, p. 19.
64. Scott, op. cit.
65. Alekseyev, p. 31.
66. Colonel-Engineer Ya. Fayemov, "The Equipment is Ready for Combat," Vestnik PVO, No. 5 (1975), pp. 59-63. (translated by FSTC)
67. Marshal of Artillery G. Peredel'skiy, "The Commander and Technical Training," Tekhnika i Vooruzheniye, No. 11 (1975), p. 2.
68. Churilov, pp. 54-57.
69. Fayemov, pp. 60-61.
70. Fayemov, pp. 59-62, and Colonel M. Kiryukhin, "Sovershenstvuy znaniya, izuchay tekhniki," Voennoy Vestnik, No. 12 (1978), pp. 94-96. (discussion recorded by Colonel Kiryukhin between three battery commanders on ways to increase the effectiveness of equipment maintenance and operation)
71. Fayemov, p. 102.
72. Ibid.
73. Colonel General V. Kubarev, "Troops at Constant Combat Readiness," Vestnik PVO, No. 1 (1975), p. 40. (translated by FSTC)
74. Fayemov, p. 62.
75. Kiryukhin, p. 164.
76. Ibid., p. 165.
77. Khyupenen, p. 26.
78. Ibid., pp. 26-27.

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